Name: Date:

Polynomial Factoring solution (version 674)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 12x + 44 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(12) \pm \sqrt{(12)^2 - 4(1)(44)}}{2(1)}$$

$$x = \frac{-(12) \pm \sqrt{144 - 176}}{2(1)}$$

$$x = \frac{-12 \pm \sqrt{-32}}{2}$$

$$x = \frac{-12 \pm \sqrt{-16 \cdot 2}}{2}$$

$$x = \frac{-12 \pm 4\sqrt{2}\, i}{2}$$

$$x = -6 \pm 2\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $8 + 7i$ and $-9 - 2i$ in standard form $(a + bi)$.**

Solution

$$(8 + 7i) \cdot (-9 - 2i)$$

$$-72 - 16i - 63i - 14i^2$$

$$-72 - 16i - 63i + 14$$

$$-72 + 14 - 16i - 63i$$

$$-58 - 79i$$

Polynomial Factoring solution (version 674)

3. **Write function $f(x) = x^3 - x^2 - 26x - 24$ in factored form. I'll give you a hint: one factor is $(x + 4)$.**

Solution

	1	-1	-26	-24
-4		-4	20	24
	1	-5	-6	0

$$f(x) = (x + 4)(x^2 - 5x - 6)$$

$$f(x) = (x + 4)(x - 6)(x + 1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 4)^2 \cdot (x + 1) \cdot (x - 2)^2 \cdot (x - 5)^2$$

Sketch a graph of polynomial $y = p(x)$.